



Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. I (Seed Technology)

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2024-2025

Syllabus for Bachelor of Science (B. Sc.) Part – I Seed Technology

PREAMBLE:

The B. Sc. Seed Technology Course-under autonomy will be effective from the academic year 2024 - 2025. It has been prepared to keep in view the unique requirements of B. Sc. Seed Technology students as per NEP-2020. The contents have been drawn up to accommodate the widening horizons of the discipline of biological sciences. The emphasis is to provide students with the latest information along with due weightage to the concepts of classical botany so that they can understand and appreciate the current interdisciplinary approaches in the study of plant sciences and their role in societal development. The Course-content also lists new practical exercises so the students get a hands-on experience with the latest techniques that are currently in use. The Course-will also inspire students to pursue higher studies in Seed Technology, for becoming an entrepreneur, and enable students to get employed in plant-based industries.

GENERAL OBJECTIVES OF THE COURSE:

1. To introduce the concept of the new concepts in seed Technology.
2. To enrich students training and knowledge that would be useful in seed industries so that the farmers will get quality seeds.
3. To develop skill in practical work, experiments and laboratory materials in seed technology.
4. To help students build up a progressive and successful career in seed industry.
5. To inculcate the sense of job responsibilities and to promote the possibilities of self-employment.

PROGRAMME OUTCOMES:

After completing B. Sc. Programme the students will.....

1. Graduate with proficiency in the subject.
2. Develop scientific attitude and become open minded, critical and curious so that they enter research field with a positive approach.
3. Develop skill in practical work, experiments and laboratory materials.
4. Become eligible to continue higher studies in their subject in India as well as abroad.

5. Become eligible to appear for the examinations for jobs in government organizations.
6. Become eligible to appear for jobs with minimum eligibility as science graduate.
7. Be able to establish their own entrepreneurial ventures.
8. Acquire increased ability of critical thinking, development of scientific attitude, handling of problems and generating solution, improve practical skills, enhance communication skill, social interaction, increase awareness in judicious use of plant resources by recognizing the ethical value system

PROGRAM SPECIFIC OBJECTIVES:

1. The students are expected to understand the fundamentals, principles, concepts and recent developments in the seed technology.
2. The practical course is framed in relevance with the theory courses to improve the understanding of the various concepts in seed technology.
3. It is expected to inspire and boost interest of the students in seed technology.
4. To develop the power of appreciations, the achievements in science and role in nature and society.
5. To enhance student sense of enthusiasm for science and to involve them in an intellectually stimulating experience of course in a supportive environment.

PROGRAMME SPECIFIC OUTCOMES:

After completing B. Sc. (Seed Technology) Programme the students will.....

1. Recall the diversity, classification, evolution and developmental changes among the plants with reference to lower and higher plant groups and create a knowledge base in understanding the basis of Seed Science and Technology.
2. Acquire and utilize the skills of post-harvest, flower design, fruit processing and dehydration techniques, organic farming and various plant processing technologies for developing the economy to the growing world.
3. Know about the importance of seeds and its relevance in modern agriculture.
4. Become competent seed technologist who can employ and implement their gained knowledge in basic and applied aspects that will profoundly influence the prevailing paradigm of agriculture, industry, healthcare and environment to provide sustainable development.
5. Demonstrate knowledge and scientific understanding to identify research problems, design experiments, use appropriate methodologies, analyze and interpret data and provide solutions.
6. Exhibit organizational skills and the ability to manage time and resources.

1. TITLE: Seed Technology

2. YEAR OF IMPLEMENTATION: 2024 - 2025

3. DURATION: 01 year

4. PATTERN: Semester examination

5. MEDIUM OF INSTRUCTION: English

6. ELIGIBILITY OF THE STUDENT:

Higher Secondary Certificate (HSC/10+2) examination or an equivalent examination

from a recognized Board with the Science stream, including Biology as one of the subjects.

7. ELIGIBILITY OF THE CORE FACULTY:

The eligibility of the faculty shall be as per the University Grants Commission (UGC)

Regulations and Guidelines.

8. STRUCTURE OF COURSE:

Level	Semester	Course	DSC	OE	AEC/VEC/IKS	Total	Degree/Cum. Cr. MEME
4.5	I	I	DSC-I (2) DSC-II (2) DSC P-I (2)	2	IKS I (2) (Generic)	22	UG Certificate 44
		II	DSC-I (2) DSC-II (2) DSC P-I (2)				
		III	DSC-I (2) DSC-II (2) DSCP-I (2)				
4.5	II	I	DSC-I (2) DSC-II (2) DSC P-I (2)	2	VEC I (2) DEGG and IIC	22	
		II	DSC-I (2) DSC-II (2) DSC P-I (2)				
		III	DSC-I (2) DSC-II (2) DSC P-I (2)				

9.COURSE TITLE:**1) FIRST SEMESTER**

Sr. No.	Subject Title	Theory				Practical		
		Course No. & Course Code	Title of Paper	No. of lectures per week	Credits		No. of Practical Per week	Credits
1	Seed Technology	Course – I BSTT 111	Seed Development and Morphology	4	4	Practical Course– I BSTP 113	2	2
		Course –II BSTT 112	Instrumentation and Techniques in Seed Technology					
2	OE	BSTTOE 1	-	2	2			
3	IKS	BSTTIKS 1	-	2	2			

2)SECOND SEMESTER

Sr. No.	Subject Title	Theory				Practical		
		Course No. & Course Code	Title of Paper	No. of lectures per week	Credits		No. of Practical Per week	Credits
1	Seed Technology	Course – III BSTT 121	Fundamentals of Seed Technology	4	4	Practical Course– II BSTP 123	2	2
		Course – IV BSTT 122	Vegetable Seed Production					
2	OE	BSTTOE-II	-	2	2			
3	VEC	BSTTVEC I	DEGG and IIC	2	2			

10. EVALUATION STRUCTURE:

Theory

Assessment Category	Internal Evaluation (Best of two CCE Marks will be considered)				ESE	Total Marks	Credits
	CCE-I	CCE-II	CCE-III	Total			
Theory of 2 Credits	10	10	10	20	30	50	02

Practical

Assessment Category	Internal Evaluation	ESE	Total Marks	Credits
	Journal / Viva/Activity			
Practical of 2 Credits	20	30	50	02

11. OTHER FEATURES:

LIBRARY:

Reference books, Textbooks, journals, and Periodicals are available in Institute and Departmental Library. (Separate reference lists are attached along with the respective course syllabus)

EQUIPMENT:

a. Computer, LCD projector, visualizer, smart board

b. Laboratory Equipment:

1. Microscope with a digital camera
2. Hot Air Oven
3. Digital weighing balance
4. Incubator
5. pH meter
6. Refrigerator
7. Microtome
8. Autoclave etc.

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s 3(6) of MPUA 2016) Faculty of Science and Technology	
	Yashavantrao Chavan Institute of Science, Satara	
	Board of Studies in Botany	
	Programme: B. Sc.	Semester – I
	Type: DSC I	Marks: 50
	Credits: 2	From: A. Y. 2024-25
Name of the Course: BSTT 111: Seed Development and Morphology		

Course Objectives: By the end of the course, students will be able to:

1. Explain the basic concepts of seed technology and seed morphology.
2. Describe crop classification and embryological development.
3. Explain reproductive biology and pollination in crops.
4. Analyze seed structure, development, and maturation.

Course Outcomes: By the end of the course, students should be able to:

1. Explain seed types, morphology, and their importance.
2. Describe crop families, floral structure, and embryo development.
3. Apply knowledge of pollination and fertilization in seed production.
4. Analyze seed structure, maturation, and food reserve storage.

Module	Title and Contents	Hrs.
Module 1	Module 1: Introduction to Seed Technology 1.1 Need and Role of Seed Technology. 1.2 Concept of Seed, Definition and types (based on endosperm, no. of cotyledons and viability), difference between Seed and Grain, importance of seed to plant and human. 1.3 Morphology of crop and seed for identification of varieties of following crops- Potato, Onion, Jowar, Wheat, Soybean & Sugarcane. (Any two locally cultivated varieties).	08
Module 2	Module 2: Crop Families and Embryology 2.1 Classification of crops (based on season, lifecycle, uses), Major crops belonging to the Dicotyledons and Monocotyledons families –Fabaceae (<i>Phaseolus</i> , <i>Glycine</i>), Brassicaceae (<i>Brassica</i> , <i>Raphanus</i>), Solanaceae (Brinjal, Tomato), Poaceae (Jowar, Maize). 2.2 Structure of anther and ovule. 2.3 Fertilization, Endosperm formation & Embryo.	07
Module 3	Module 3: Reproductive Biology	08

	3.1 Structure of Dicotyledonous and Monocotyledonous flowers- Unisexual (Cucurbits and Maize) and Bisexual (Beans and Jowar); Monoecious, Dioecious Plants. 3.2 Pollination and Pollinating agents. 3.4 Apomixis & Polyembryony.	
Module 4	Module 4: Seed structure and Development 4.1 Structure of Dicotyledonous and Monocotyledon seeds, external and internal characters e.g. Cotton, Pea, Castor and Maize. 4.2 Seed ripening and maturation process. 4.3 Storage of reserve food in seeds.	07
Reference Books: 1. Agrawal, R.L. "Seed Technology". New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd., 1997. 2. Copeland, L.O., and McDonald, M.B. "Principles of Seed Science and Technology". New York: Springer Science & Business Media, 2001. 3. Bewley, J.D., Bradford, K.J., Hilhorst, H.W.M., and Nonogaki, H. "Seeds: Physiology of Development, Germination and Dormancy". New York: Springer, 2013. 4. Singh, B.D. "Plant Breeding: Principles and Methods". New Delhi: Kalyani Publishers, 2015. 5. Basra, A.S. "Handbook of Seed Science and Technology". New York: Food Products Press, 2006.		
Evaluation Pattern:		
Total Marks: 50		
Internal Continuous Evaluation (20 Marks): • CCE - I: 10 Marks: Home Assignment • CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit • CCE- III: 10 marks: Compulsory MCQ test • (Note: Best of two CCE marks will be considered)		End Semester Examination (30Marks): • Question-1: Solve the following questions (five questions of 2 marks) 10 M • Question-2: Attempt any two questions (three questions of 10marks) 20 M • Question-3: Attempt any four questions (five questions of 5 marks) 20 M • Note: Conversion of 50 marks of ESE to 30 marks

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	Board of Studies in Botany	
	Programme: B. Sc.	Semester – I
	Type: DSC II	Marks: 50
	Credits: 2	From: A. Y. 2024-25
	Name of the Course: BSTT 112: Instrumentation and Techniques in Seed Technology	

Course Objectives: By the end of the course, students will be able to:

1. Explain the principles and objectives of seed processing and drying.
2. Describe the construction and working of seed processing machines.
3. Explain seed treatment methods and seed processing plant operations.
4. Analyze seed storage, packing, labeling, and record management.

Course Outcomes: By the end of the course, students should be able to:

1. Explain the principles of seed processing and drying techniques.
2. Describe the operation of major seed processing machines.
3. Apply seed treatment methods and processing plant operations.
4. Analyze seed storage, packaging, and quality maintenance practices.

Module	Title and Contents	Hrs.
Module 1	Module 1: Instrumentation for Seed processing 1.1 Concept and objectives of seed processing: concept and importance, Basic flow pattern, seed processing pathway of seed improvement, physical characteristics used to separate seeds. 1.2 Instruments for seeds processing: Scalper, Debarred, Maize Scarifier and Sheller, licensing of machines. 1.3 Seed drying: advantages of seed drying, moisture content, Orthodox/recalcitrant methods of seed moisture measurements, of seed drying (wet and dry seeds), advantages of mechanical drying equipment's dehumidification and drying of heat sensitive seeds, relative humidity and equilibrium, moisture content of seeds.	08
Module 2	Module 2: Seed processing machines 2.1 Principle, construction, working, adjustments, cleaning and uses	07

	of seed processing machines: i. Air screen cleaner cum grader ii. Specific gravity separator, aspirators, pneumatic aspirators, stoner iii. Roll mill iv. Magnetic separators, Spiral separators, dropper best separator, electrostatic separators	
Module 3	Module 3: Seed treatment and Seed processing plant 3.1 Seed Treatment: Principle, construction, working, adjustments and uses of slurry seed treater, mist-o-matic seed treater, storage and labeling of treated seeds, seed user's safety. 3.2 Seed processing plant: Site selection, layout of machines in a seed processing plant for efficient product, seeds in post-harvest phase, conservation of energy and production. 3.3 Seed conveyors and elevator: bucket elevator, belt conveyor, screen conveyor, oscillation conveyor, pneumatic conveyor.	08
Module 4	Module 4: Seed storage and packing 4.1 Seed storage: Structures and their management. 4.2 Packing and marketing of seeds- Bagger, weigher, bag closing, portable and conveyor type of bag closer, labeling and maintaining lot identity, lot numbers, seed pellets, handling and stacking, maintenance of seed processing records.	07
Reference Books: 1. Agrawal, R.L. "Seed Technology". New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd., 1997. 2. Copeland, L.O., and McDonald, M.B. "Principles of Seed Science and Technology". New York: Springer Science & Business Media, 2001. 3. Basra, A.S. "Handbook of Seed Science and Technology". New York: Food Products Press, 2006. 4. Justice, O.L., and Bass, L.N. "Principles and Practices of Seed Storage". Washington, D.C.: USDA Agriculture Handbook, 1978. 5. Tunwar, N.S., and Singh, S.V. "Indian Minimum Seed Certification Standards". New Delhi:		

Central Seed Certification Board, Department of Agriculture & Cooperation, Government of India, Latest Edition.

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation (20 Marks):

- CCE - I: 10 Marks: Home Assignment
- CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit
- CCE- III: 10 marks: Compulsory MCQ test
- **(Note: Best of two CCE marks will be considered)**

End Semester Examination (30Marks):

- Question-1: Solve the following questions (five questions of 2 marks) 10 M
- Question-2: Attempt any two questions (three questions of 10marks) 20 M
- Question-3: Attempt any four questions (five questions of 5 marks) 20 M
- **Note:** Conversion of 50 marks of ESE to 30 marks



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Board of Studies in Botany

Programme: B. Sc.

Semester – I

Type: DSC P

Marks: 50

Credits: 2

From: A. Y. 2024-25

Name of the Course: Practical Course-BSTP 113: (Based on theory paper BSTT 111 and BSTT 112)

Course Objectives: By the end of the course, students will be able to:

1. Develop skills in identifying crop families, seed morphology, and floral biology.
2. Demonstrate the operation of seed processing and conveying equipment.
3. Perform seed moisture testing, seed treatment, and fumigation practices.
4. Apply practical knowledge of seed processing, storage, and marketing operations

Course Outcomes: By the end of the course, students should be able to:

1. Identify important crop families, seed structures, and floral characteristics.
2. Operate and demonstrate seed processing and conveying equipment.
3. Perform seed treatment, fumigation, and seed moisture estimation techniques.
4. Apply practical knowledge of seed processing, storage, and warehouse management.

Practical No.	Title and Contents	No. of hours per practicals
1.	Study of family Fabaceae.	04
2.	Study of family Brassicaceae.	04
3.	Study of family Solanaceae.	04
4.	Study of family Poaceae.	04
5.	Morphology of Monocot seeds and Dicot seeds.	04
6.	Morphological study of any two varieties of the following crops – Soybean, Sugarcane, Jowar, Wheat.	04
7.	Study of floral biology of monocots and dicots.	04
8.	Study of bucket elevator, screw conveyers and pneumatic elevators.	04
9.	Study of threshing machine and its use.	04
10.	Fumigation-principle and practical application.	04
11.	Demonstration & handling of stereo binocular microscope.	04
12.	Study of seed processing machines.	04
13.	Measurement of seed moisture content by OSWA & moisture meter/ oven drying method.	04
14.	Study seed treating equipment- Seed dresser.	04
15.	Visits to warehouse, godowns and market	04

Reference Books:

1. Agrawal, R.L. "Seed Technology". New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd., 1997.
2. Copeland, L.O., and McDonald, M.B. "Principles of Seed Science and Technology". New York: Springer Science & Business Media, 2001.
3. Basra, A.S. "Handbook of Seed Science and Technology". New York: Food Products Press, 2006.
4. Justice, O.L., and Bass, L.N. "Principles and Practices of Seed Storage". Washington, D.C.: USDA Agriculture Handbook, 1978.
5. Tunwar, N.S., and Singh, S.V. "Indian Minimum Seed Certification Standards". New Delhi: Central Seed Certification Board, Department of Agriculture & Cooperation, Government of India, Latest Edition.

Evaluation Pattern:**Total Marks: 50****Internal Evaluation (20 marks):**

- Journal: 10 Marks
- Students Performance: 10 Marks

End Semester Examination (30 Marks):

- 4 questions

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	Programme: B. Sc.	Semester – II
	Type: DSC III	Marks: 50
	Credits: 2	From: A. Y. 2024-25
Name of the Course: BSTT 121: Fundamentals of Seed Technology		
Course Objectives: By the end of the course, students will be able to: 1. Explain the concepts, objectives, and scope of seed technology. 2. Describe floral biology, seed development, and seed structure. 3. Explain the processes of seed germination and dormancy. 4. Evaluate seed viability, vigour, and deterioration for quality seed production.		
Course Outcomes: By the end of the course, students should be able to: 1. Explain the role, scope, and importance of seed technology and the seed industry. 2. Describe floral structure, seed development, and the features of monocot and dicot seeds. 3. Explain seed germination, dormancy, and methods of breaking dormancy. 4. Evaluate seed viability, vigour, ageing, and deterioration in relation to seed quality.		
Module	Title and Contents	Hrs.
Module 1	Module 1: Seed Technology and its role 1.1 Seed Technology- Concept and Objective: Concept of Seed and Grain. 1.2 Types of seed, Role of Seed Technology. 1.3 Scope of seed technology in employment generation. 1.4 Seed Industry scenario in India. Seed industry & global market.	08
Module 2	Module 2: Structure of flower and seed development 2.1 Floral structure in relation to seed development, Microsporogenesis and Megasporogenesis. 2.2 Types and mechanism of Self- incompatibility and male sterility. Agencies for pollination. 2.3 Seed Development, Seed coat structure and development. External and internal features of monocot and dicot seeds, Seed Dispersal.	07

Module 3	Module 3: Seed Dormancy and its Germination 3.1 Seed germination; Types of Seed germination (epigeal and hypogeal). 3.2 Physiological process during seed germination; Factors affecting on seed germination. 3.3 Seed dormancy- types, significance, mechanism (endogenous and exogenous). 3.4 Factors regulating seed dormancy, Methods of breaking dormancy, Genetic control of seed dormancy. 3.5 Role of phytochrome and PGRs	08
Module 4	Module 4: Seed Viability and Seed Vigour 4.1 Seed viability, causes for loss of seed viability. 4.2 Seed vigour- importance and underlying genetic mechanism. 4.3 Physiological basis of seed vigour, Seed ageing. 4.4 Physiology of seed deterioration; seed viability theories in relation to crop performance and yield.	07

Reference Books:

1. Bewley, J.D., Bradford, K.J., Hilhorst, H.W.M. and Nonogaki, H. Seeds: Physiology of Development, Germination and Dormancy. New York: Springer, 2013.
2. George, R.A.T. Vegetable Seed Production. 3rd ed. Wallingford: CABI Publishing, 2016.
3. Copeland, L.O. and McDonald, M.B. Principles of Seed Science and Technology. 6th ed. New York: Springer, 2021.
4. Government of India. Indian Minimum Seed Certification Standards. New Delhi: Department of Agriculture and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, 2022.
5. FAO. Quality Declared Seed System. Rome: Food and Agriculture Organization of the United Nations, 2023.

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation (20 Marks): • CCE - I: 10 Marks: Home Assignment • CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit • CCE- III: 10 marks: Compulsory MCQ test • (Note: Best of two CCE marks will be considered)	End Semester Examination (30Marks): • Question-1: Solve the following questions (five questions of 2 marks) 10 M • Question-2: Attempt any two questions (three questions of 10marks) 20 M • Question-3: Attempt any four questions (five questions of 5 marks) 20 M • Note: Conversion of 50 marks of ESE to 30 marks
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	Board of Studies in Botany	
	Programme: B. Sc.	Semester – II
	Type: DSC IV	Marks: 50
	Credits: 2	From: A. Y. 2024-25
Name of the Course: BSTT 122: Vegetable Seed Production		
Course Objectives: By the end of the course, students will be able to: 1. Explain the principles, scope, and importance of vegetable seed production. 2. Describe pollination, hybridization, and breeding techniques in vegetable crops. 3. Explain breeding methods and recent advances in vegetable seed production. 4. Apply the principles of quality seed production in vegetable crops.		
Course Outcomes: By the end of the course, students should be able to: 1. Explain the importance, classification, and role of vegetable seed production. 2. Describe pollination, hybridization, and crossing techniques in vegetable crops. 3. Explain breeding methods and recent advances in vegetable seed production. 4. Apply recommended practices for quality seed production of fruit, root, and bulb vegetable crops.		
Module	Title and Contents	Hrs.
Module 1	Module 1: Vegetable Seed Production 1.1 Historical account, present status, importance and future of vegetable seed production, objectives of vegetable breeding. 1.2 Classification of vegetable crops- Root crops, bulb crops leafy crops, flowering crops and fruit crops. 1.3 Role of Apomixis in vegetable seed production.	08
Module 2	Module 2: Techniques in Hybridization 2.1 Pollination: Types, natural cross pollination, extent of it in vegetable crops, its role in vegetable seed production and pollination vectors in vegetable crop. 2.2 Hybridization: Introduction, definition and role 2.3 Steps involved in hybridization (emasculation, pollination, bagging tagging) 2.4 Simple, back and test cross.	07

Module 3	Module 3: Breeding and Recent Advances 3.1 Introduction: Definition, collection, maintenance, evaluation storage, role and utilization. 3.2 Selection Methods (Pedigree and Bulk): Definition, methods, and achievements. 3.3 Recent advances in vegetable seed production.	08
Module 4	Module 4: Requirements of Vegetable Seed Production Seed Production of Fruit crop, Root Crop and Bulb crop with respect to following steps: a) Land requirement b) Seedling/Root production c) Nursery management d) Planting e) Cultural practices f) Breeding methods used g) Plant protection h) Seed harvesting i) Seed drying j) Seed grading k) Seed extraction (Wet - dry methods)	07
Reference Books: 1. Rubatzky, V.E., Yamaguchi, M. and World Vegetables. Principles, Production and Nutritive Values. New York: Springer, 2017. 2. Singh, B.D. Plant Breeding: Principles and Methods. New Delhi: Kalyani Publishers, 2018. 3. Acquaah, G. Principles of Plant Genetics and Breeding. 3rd ed. Hoboken: John Wiley & Sons, 2020. 4. Copeland, L.O. and McDonald, M.B. Principles of Seed Science and Technology. 6th ed. New York: Springer, 2021. 5. Government of India. Indian Minimum Seed Certification Standards. New Delhi: Department of Agriculture and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, 2022.		
Evaluation Pattern:		
Total Marks: 50		
Internal Continuous Evaluation (20 Marks): • CCE - I: 10 Marks: Home Assignment • CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit • CCE- III: 10 marks: Compulsory MCQ test • (Note: Best of two CCE marks will be considered)		End Semester Examination (30Marks): • Question-1: Solve the following questions (five questions of 2 marks) 10 M • Question-2: Attempt any two questions (three questions of 10marks) 20 M • Question-3: Attempt any four questions (five questions of 5 marks) 20 M • Note: Conversion of 50 marks of ESE to 30 marks



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Faculty of Science and Technology

Yashavantrao Chavan Institute of Science, Satara

Board of Studies in Botany

Programme: B. Sc.

Semester – II

Type: DSC P

Marks: 50

Credits: 2

From: A. Y. 2024-25

Name of the Course: Practical Course-BSTP 123: (Based on theory paper BSTT 121 and BSTT 122)

Course Objectives: By the end of the course, students will be able to:

1. Explain the principles and techniques of vegetable seed production.
2. Demonstrate pollen viability, hybridization, and emasculation techniques.
3. Perform seed germination, dormancy-breaking, and seed quality assessment methods.
4. Apply scientific methods for seed production and crop management through practicals and field visits.

Course Outcomes: By the end of the course, students should be able to:

1. Perform pollen viability and seed germination tests using standard methods.
2. Demonstrate hybridization, emasculation, and artificial seed synthesis techniques.
3. Identify seed production practices in self- and cross-pollinated crops.
4. Apply practical knowledge of seed production, drying, planting methods, and vegetable crop management through laboratory and field studies.

Practical No.	Title and Contents	No. of hours per practical
1.	Study of Pollen viability.	04
2.	Different germination tests by using Course-Paper towel and petridish method.	04
3.	Methods of breaking seed dormancy.	04
4.	Study of hybridization technique with respect to any crop.	04
5.	Study of self-pollinated crops.	04
6.	Study of cross-pollinated crops.	04
7.	Study of synthesis of artificial seed.	04
8.	Study of emasculation of various crops.	04
9.	Study of epigeal seed germination.	04
10.	Study of hypogeal seed germination.	04
11.	Study of viviparous seed germination.	04
12.	Study of Fruit crop-Tomato; Root crop-Radish; Bulb crop-Onion.	04
13.	Study of seed drying methods.	04
14.	Study of planting methods.	04
15.	Visit to Botanical Garden.	04

Reference Books:

1. Copeland, L.O. and McDonald, M.B. Principles of Seed Science and Technology. 6th ed. New York: Springer, 2021.
2. George, R.A.T. Vegetable Seed Production. Wallingford: CABI Publishing, 2016.
3. Acquaah, G. Principles of Plant Genetics and Breeding. 3rd ed. Hoboken: John Wiley & Sons, 2020.
4. Singh, B.D. Plant Breeding: Principles and Methods. New Delhi: Kalyani Publishers, 2018.
5. ISTA. International Rules for Seed Testing. Bassersdorf, Switzerland: International Seed Testing Association, 2024.
6. Government of India. Indian Minimum Seed Certification Standards. New Delhi: Department of Agriculture and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, 2022.

Evaluation Pattern:**Total Marks: 50****Internal Evaluation (20 marks):**

- Journal: 10 Marks
- Students Performance: 10 Marks

End Semester Examination (30 Marks):

- 4 questions

Study Tour/ Excursion:

One teacher along with a batch not more than 20 students is taken for excursions to places of study interest, one in each term. If there are female students in a batch of sixteen, one additional lady teacher is permissible for excursion. Each excursion will not be more than 3 days during college working days. T.A. and D.A. for teachers and non-teaching staff participating in the excursions should be paid as per the rules. The tour report duly certified by the concerned teacher and the head of the department should be submitted at the time of practical examination